

City of Grove

Pavement Management Plan



Presentation Overview

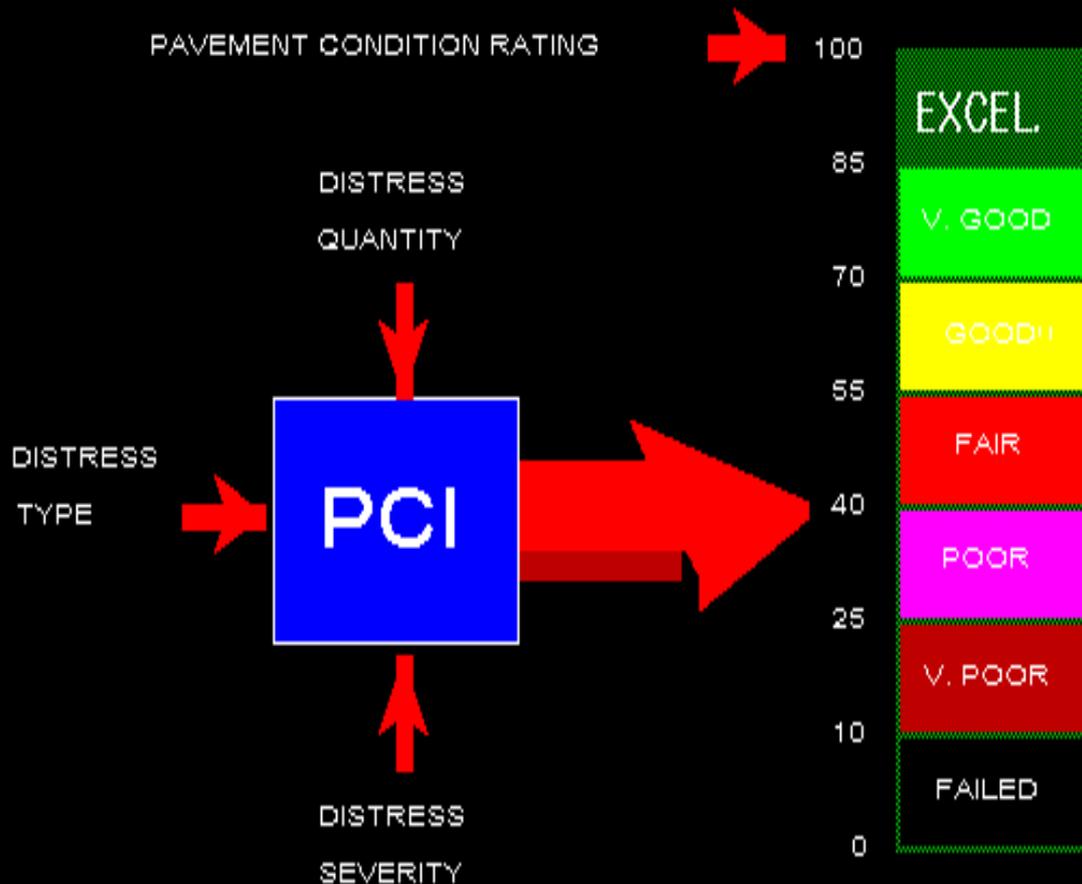
- Background
- Data Collection
- Data Update
- Data Interpretation
- Project Results
- Questions

Background



Pavement Condition Index (PCI)

PCI Concept

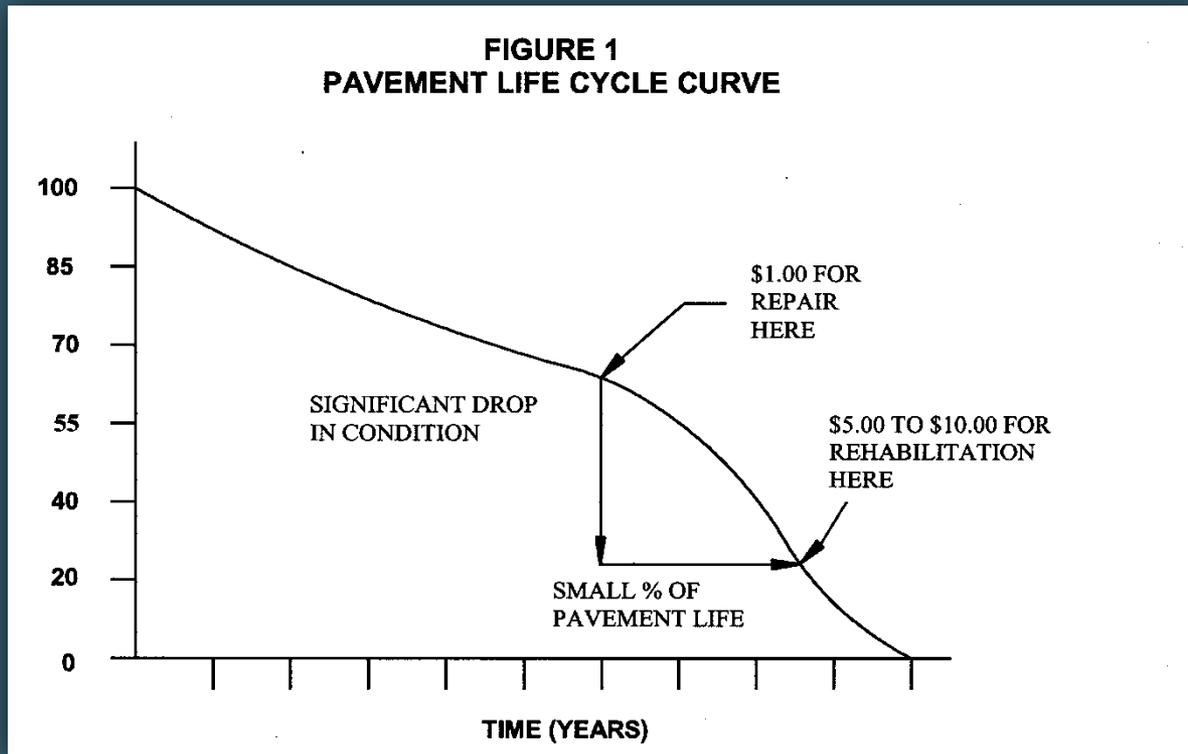


The PCI is determined by measuring observable distresses in the pavement.

The type, severity and quantity are determined for every observed distress within a sample and combined to compute the PCI.

MicroPAVER Methodology

Developed U.S. Army
Construction Engineering
Research Laboratories and APWA



Goals of Pavement Management Systems

- Comprehensive Inventory of Street Characteristics
- Prediction Methodology for Budgeting
- Cost Effective Use of Limited Budgets
- Higher Quality Street System



MicroPAVER & ICON

- Pavement Management Systems
- MicroPAVER
 - Provides Consistent, Widely Used Method for Pavement Condition Rating (ASTM D6433-11)
- ICON
 - Determines M&R Needs
 - Establishes Priorities
 - Calculate Optimal Time for Repair



Data Collection



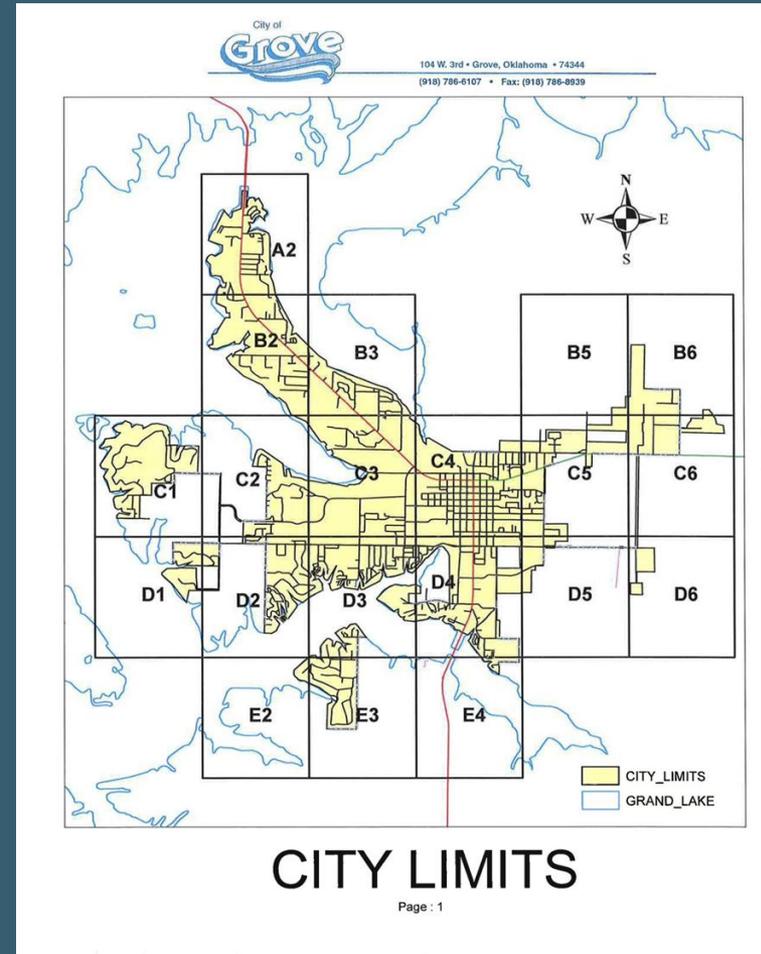


Data Collection

- Network Definition
- Pavement Condition Survey
- Drainage Survey
- Curb & Sidewalk Surveys
- Work History

Network Definition

A pavement network is made up of a number of individual pavement segments with unique maintenance needs.

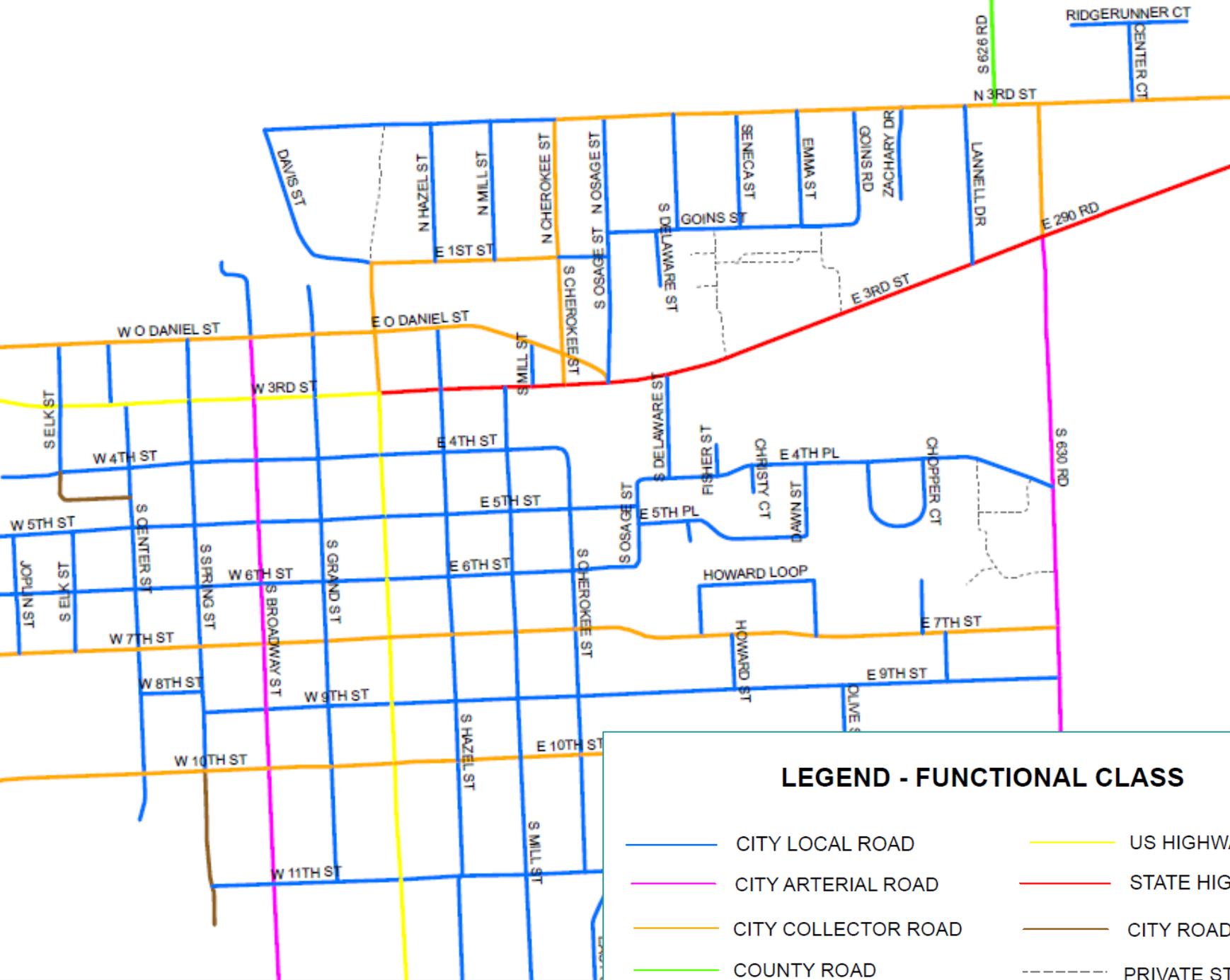


Objective is to divide the network into sufficient but manageable segments for tracking pavement data.



Network Definition

- Functional Class
- Branch
- Section
- Sample Units



LEGEND - FUNCTIONAL CLASS

- | | | | |
|--|---------------------|---|-------------------|
|  | CITY LOCAL ROAD |  | US HIGHWAY |
|  | CITY ARTERIAL ROAD |  | STATE HIGHWAY |
|  | CITY COLLECTOR ROAD |  | CITY ROAD/UNPAVED |
|  | COUNTY ROAD |  | PRIVATE STREET |



Branches and Sections

- Surface Type
- Construction History
- Pavement Condition

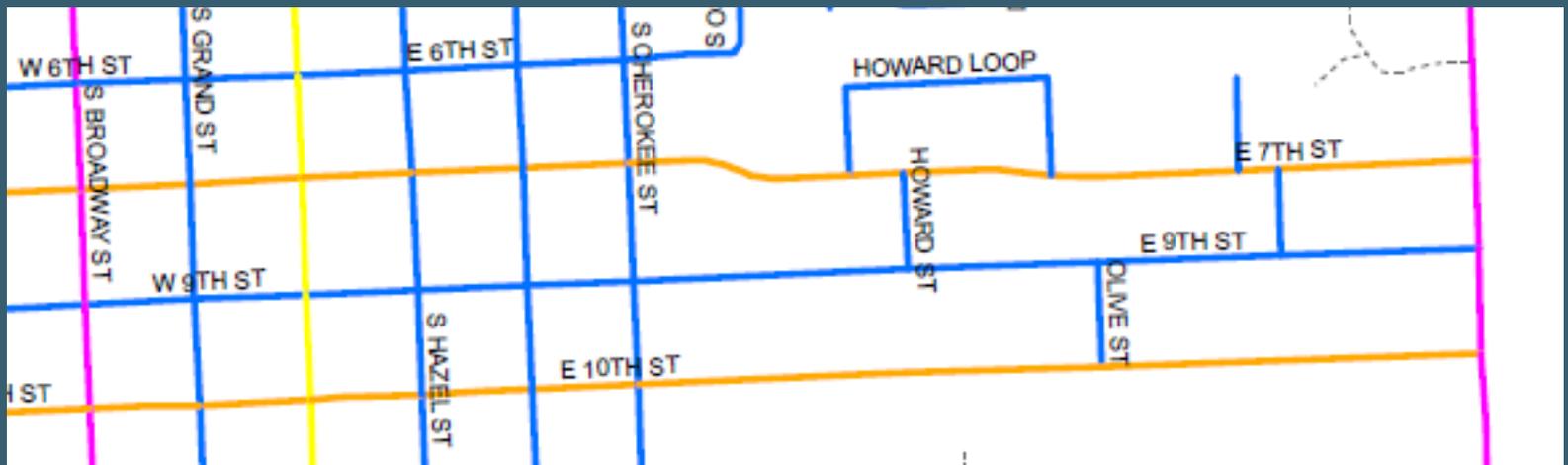
Branch

E 7th St.

Sections

E 7th St. from Main St. to Cherokee St.

E 7th St. from Cherokee St. to S 630 Rd.





Pavement Condition Survey

- 19 different distress types for both asphalt and concrete
- Low, medium and high severities
- Data collection performed with a tablet computer

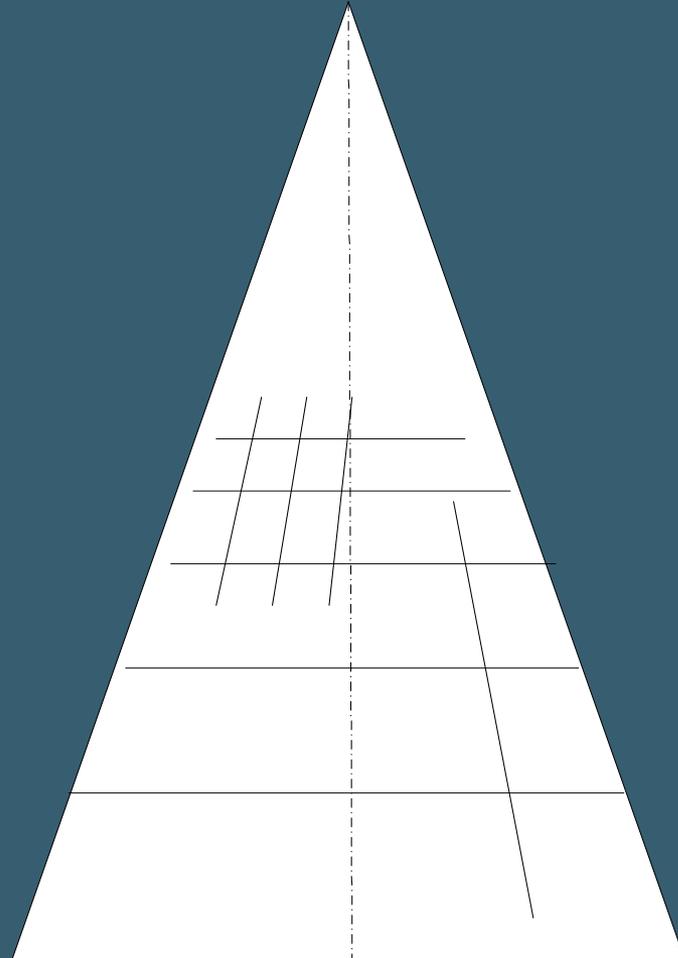
Typical Distresses

Asphalt

Long. & Trans. Cracking
Block Cracking
Rutting
Weathering

Concrete

Linear cracking
Durability Cracking
Joint Spalling
Joint Seal Damage



Drainage Survey

- Noted obvious drainage issues like ponding and depressions



A vertical photograph on the left side of the slide shows a paved road with a yellow double line in the center, a concrete curb, and a sidewalk. The background shows a grassy area and some buildings under a cloudy sky.

Curb and Sidewalk Surveys

- Assigned subjective condition rating of Good, Fair or Poor
- Recorded physical dimensions

Data Update





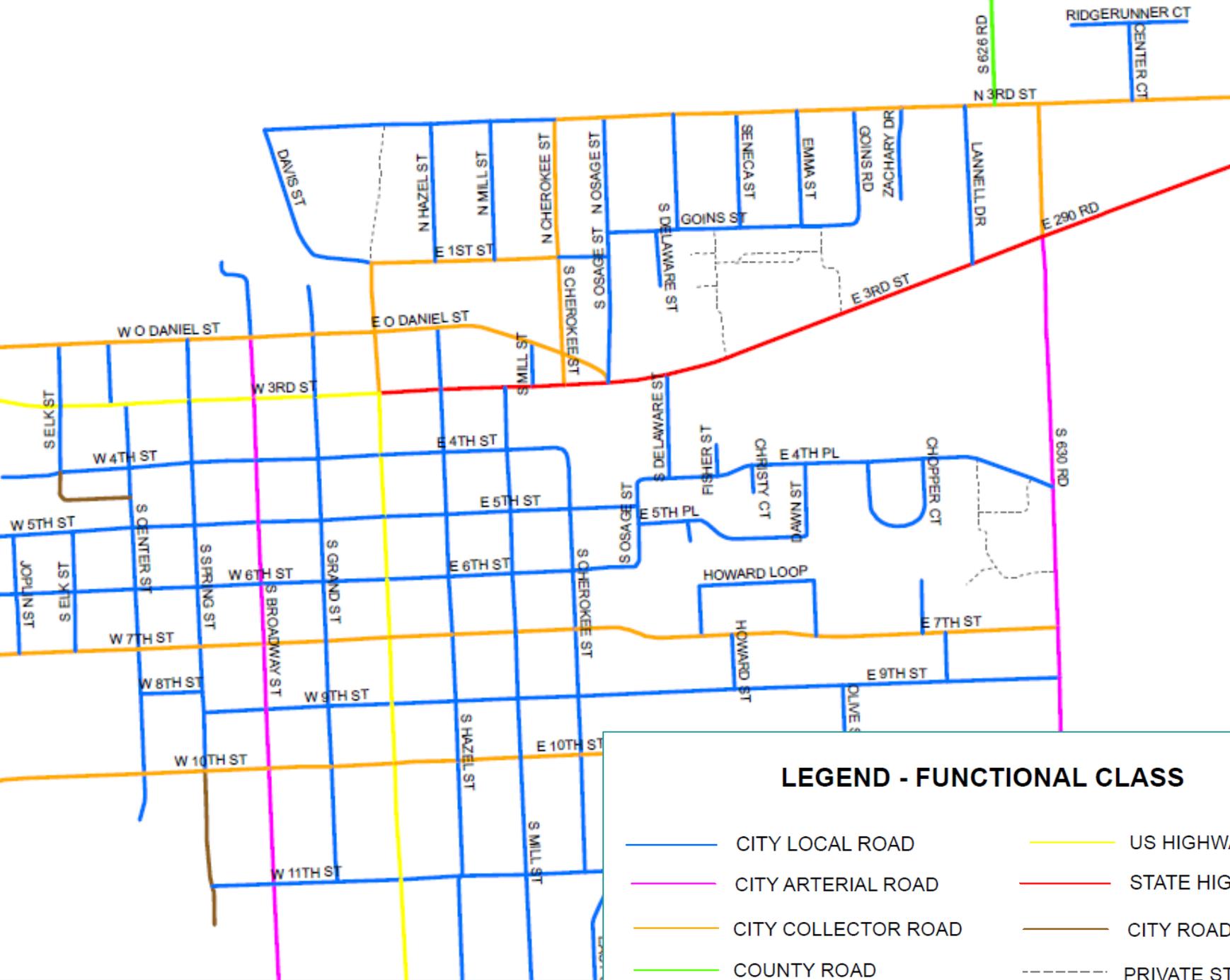
Work History

- City staff provided a map and list of recent maintenance projects
- Established most recent maintenance activities and dates for each section



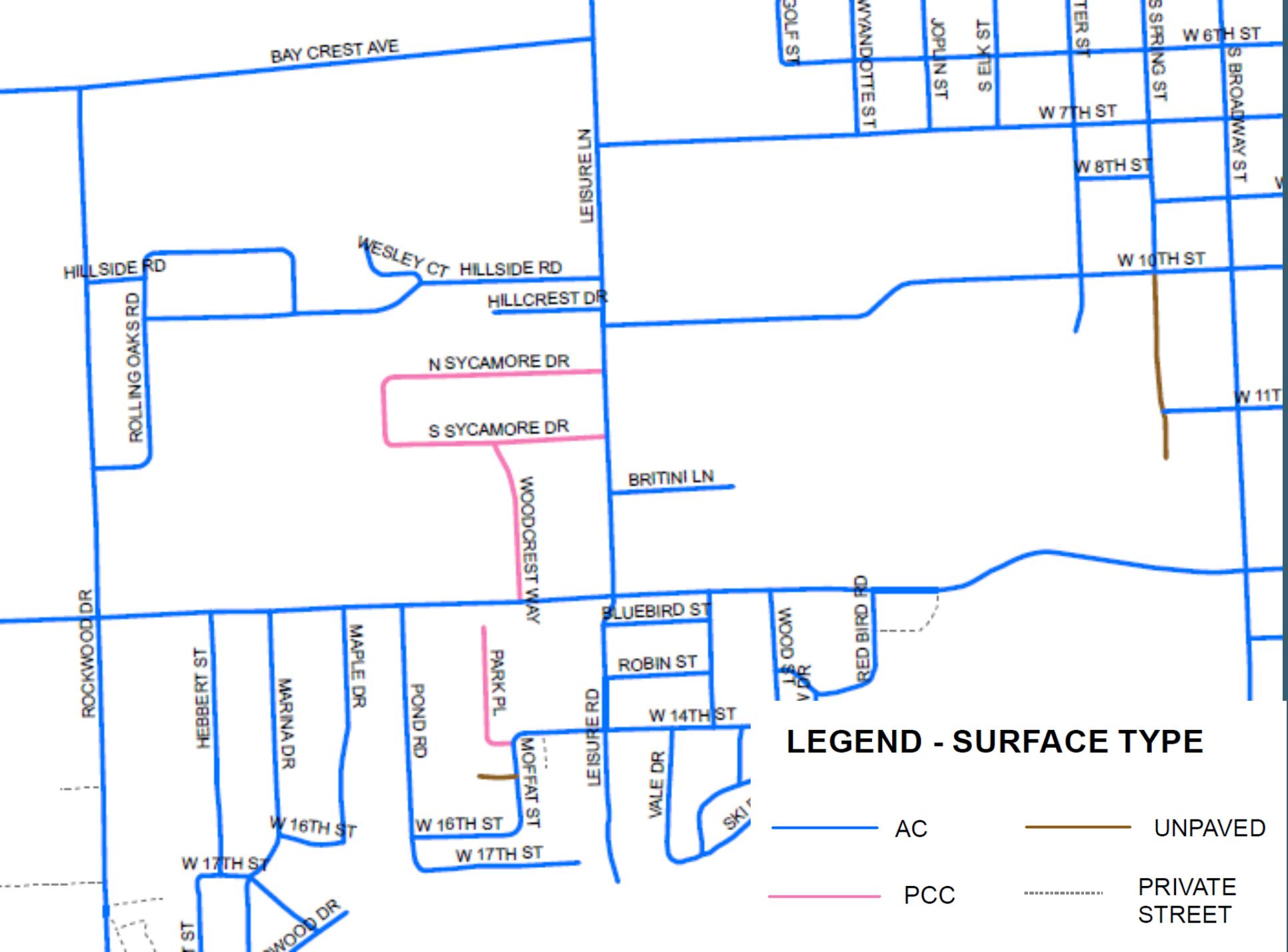
GIS Maps

- Linked the database with map files to provide graphical displays of key data:
- Functional Class
- Surface Type
- PCI



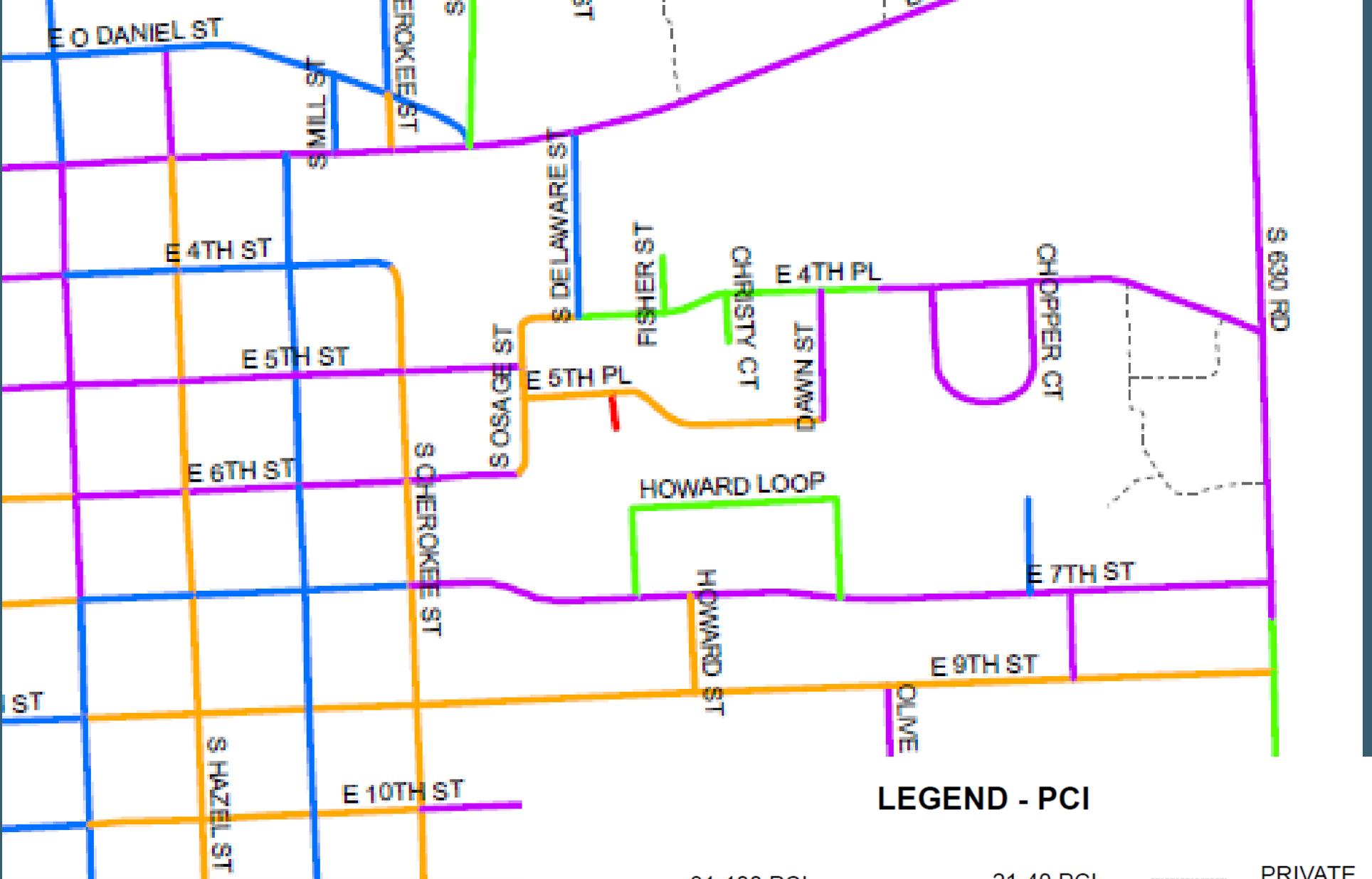
LEGEND - FUNCTIONAL CLASS

- | | | | |
|--|---------------------|---|-------------------|
|  | CITY LOCAL ROAD |  | US HIGHWAY |
|  | CITY ARTERIAL ROAD |  | STATE HIGHWAY |
|  | CITY COLLECTOR ROAD |  | CITY ROAD/UNPAVED |
|  | COUNTY ROAD |  | PRIVATE STREET |



LEGEND - SURFACE TYPE

- AC
- PCC
- UNPAVED
- - - - - PRIVATE STREET



LEGEND - PCI

- | | | | | | |
|---|------------|---|-----------|---|----------------|
|  | 81-100 PCI |  | 21-40 PCI |  | PRIVATE STREET |
|  | 61-80 PCI |  | 0-20 PCI | | |
|  | 41-60 PCI |  | UNPAVED | | |

Data Interpretation

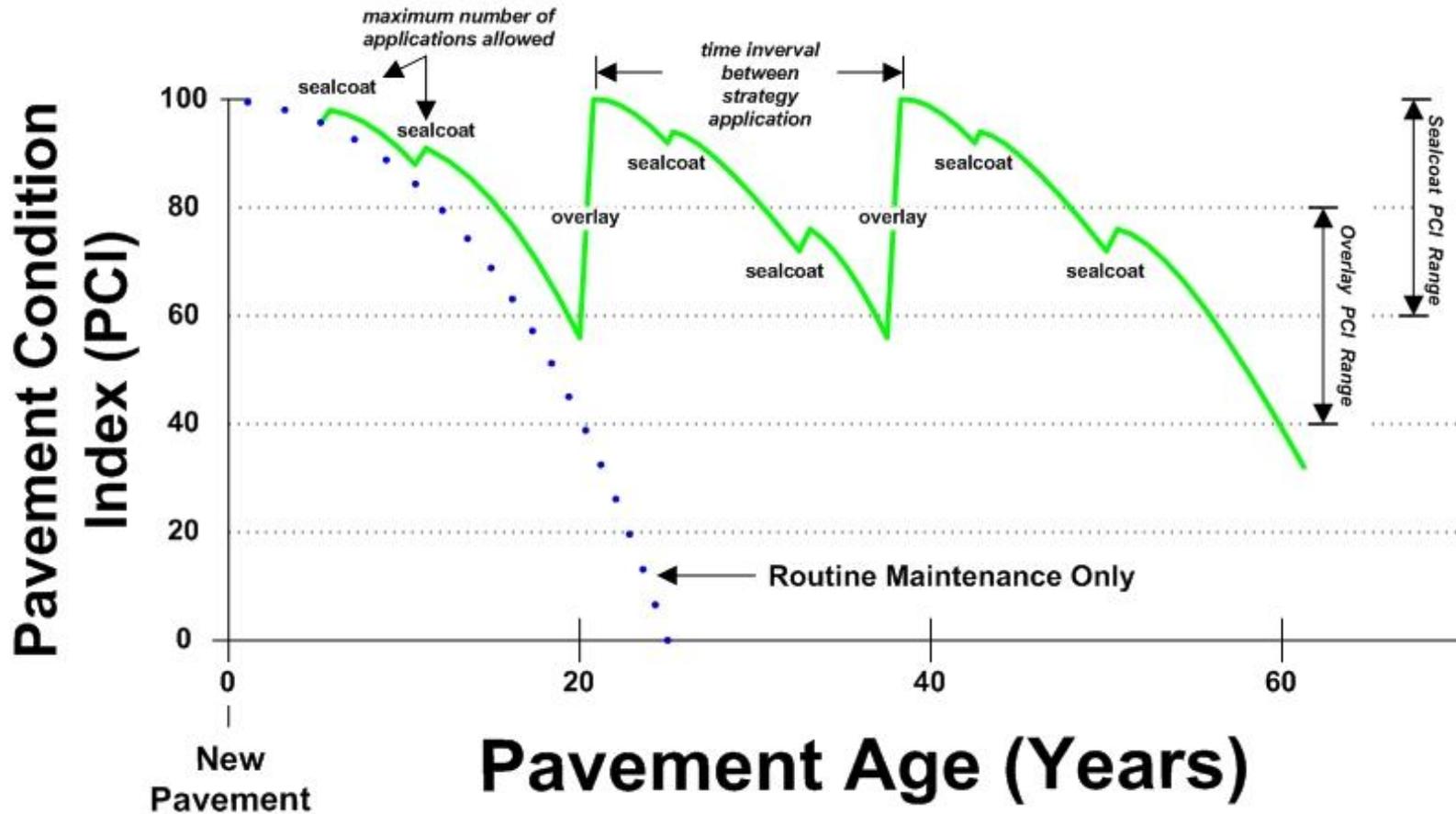




Data Interpretation and Pavement Management Plan Development

- Establish Maintenance Treatment Costs and Rehabilitation Strategies
- Develop pavement performance curves
- Establish Maintenance Funding Needs
- Develop Alternative Funding Scenarios
- Recommend Best Scenario

The Pavement Life Cycle



Summary of Local Maintenance Strategies

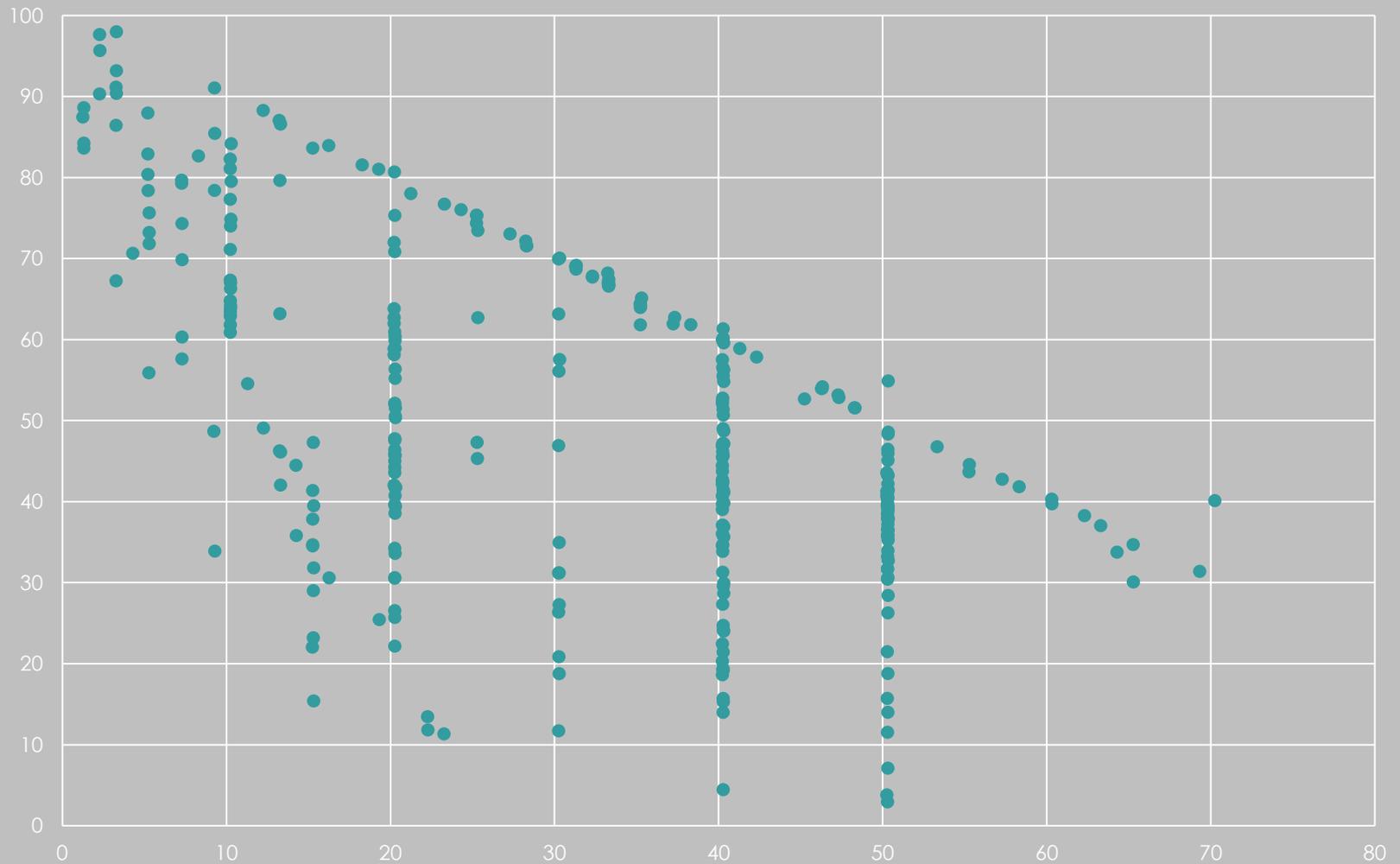
<u>Local Strategy</u>	<u>Unit Cost</u>
Crack Sealing - AC	\$1.00/Ft
Crack Sealing - PCC	\$2.00/Ft
Diamond Grinding	\$1.00/Sq.Ft
Full Depth Patch - AC	\$5.00/Sq.Ft
Full Depth Patch - PCC	\$6.00/Sq.Ft
Grading	\$2.00/Ft
Joint Sealing - PCC	\$2.00/Ft
Localized Milling	\$0.50/Sq.Ft
Localized Surface Treatment	\$1.00/Sq.Ft
Partial Depth Patch - PCC	\$10.00/Sq.Ft
Patching - AC Shallow	\$2.00/Sq.Ft
Skin Patch – AC	\$0.50/Ft
Slab Replacement	\$6.00/Sq.Ft

Summary of Global Rehabilitation Strategies

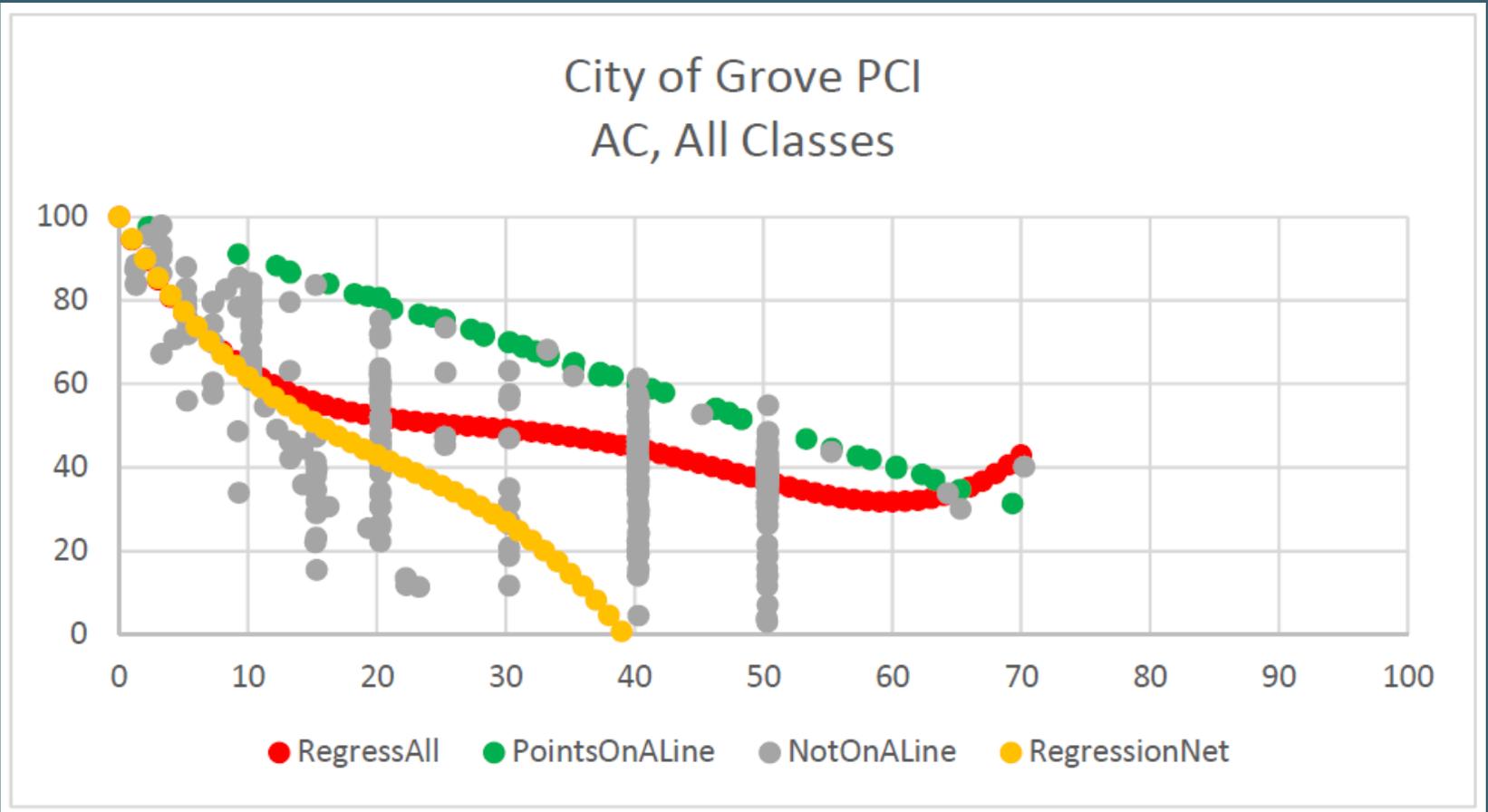
Policy: Default	<u>Unit Cost</u>	<u>PCI Range</u>		<u>Number Of</u> <u>Applications</u>	<u>Req. Year In</u> <u>Between</u>
<u>Global Strategy</u>		<u>From</u>	<u>To</u>		
<u>Func. Class</u>	<u>SurfaceType</u>				
CITY ARTERIAL ROAD - AC					
Reconstruction - AC	\$5.00 / Sq.Ft	0	30	2	30
Assumed Construction	\$0.00 / Sq.Ft	0	0	0	99
Reprocess and Overlay	\$3.00 / Sq.Ft	30	50	1	10
Overlay AC - Structural	\$1.75 / Sq.Ft	40	70	2	10
Surface Treatment - AC	\$0.50 / Sq.Ft	70	80	4	4
Patching & Sealing - AC	\$0.05 / Sq.Ft	80	94	5	2
CITY COLLECTOR ROAD - AC					
Reconstruction - AC	\$5.00 / Sq.Ft	0	30	2	30
Reprocess and Overlay	\$3.00 / Sq.Ft	30	50	1	10
Overlay AC - Structural	\$1.75 / Sq.Ft	40	70	2	10
Patching & Sealing - AC	\$0.05 / Sq.Ft	80	94	5	2
Surface Treatment - AC	\$0.50 / Sq.Ft	70	80	4	4
Assumed Construction	\$0.00 / Sq.Ft	0	0	0	99
CITY LOCAL ROAD - AC					
Reconstruction - AC	\$5.00 / Sq.Ft	0	30	2	30
Patching & Sealing - AC	\$0.05 / Sq.Ft	80	94	5	2
Surface Treatment - AC	\$0.50 / Sq.Ft	70	80	4	4
Overlay AC - Structural	\$1.75 / Sq.Ft	40	70	2	10
Assumed Construction	\$0.00 / Sq.Ft	0	0	0	99
Reprocess and Overlay	\$3.00 / Sq.Ft	30	50	1	10
CITY LOCAL ROAD - PCC					
Patching & Sealing - PCC	\$0.05 / Sq.Ft	60	75	5	5
Rehabilitation - PCC	\$1.00 / Sq.Ft	40	60	2	15
Sealing - PCC	\$0.05 / Sq.Ft	75	90	5	3
Reconstruction - AC	\$8.00 / Sq.Ft	0	40	2	40
Assumed Construction	\$0.00 / Sq.Ft	0	0	0	99

Performance Curves

City of Grove PCI
AC, All Classes



Performance Curves



Initial Funding Backlog

Repair Category	2015 Backlog Amount	2015 Backlog Percentage
Routine	\$380,850	1.5 %
Preventive	\$871,910	3.4 %
Major Rehabilitation	\$16,672,920	65.4 %
Reconstruction	\$7,573,210	29.7 %

\$25,498,890

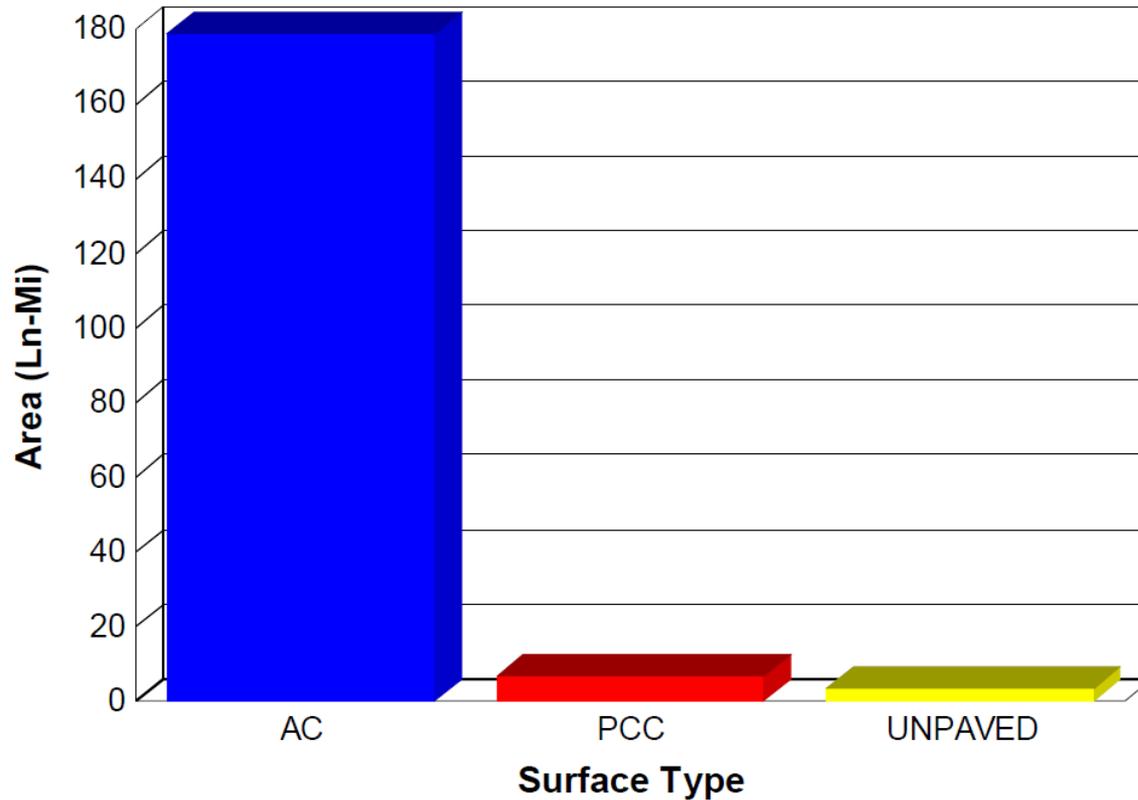
Project Results



Average PCI = 51

City of Grove Summary Chart

Lane Mileage vs. Surface Type



<u>Pavement Surface Type</u>	<u>Lane Miles</u>	<u>Average PCI</u>
AC	179	50
PCC	7	66
UNPAVED	3	0



Alternative Funding Scenarios

- Current Funding - \$1M/Year
- Level PCI (51) - \$1M in 2015 then adding \$150K/Year thru 2019
- PCI = 55 in 2019 - \$1M in 2015 then adding \$350K/Year thru 2019

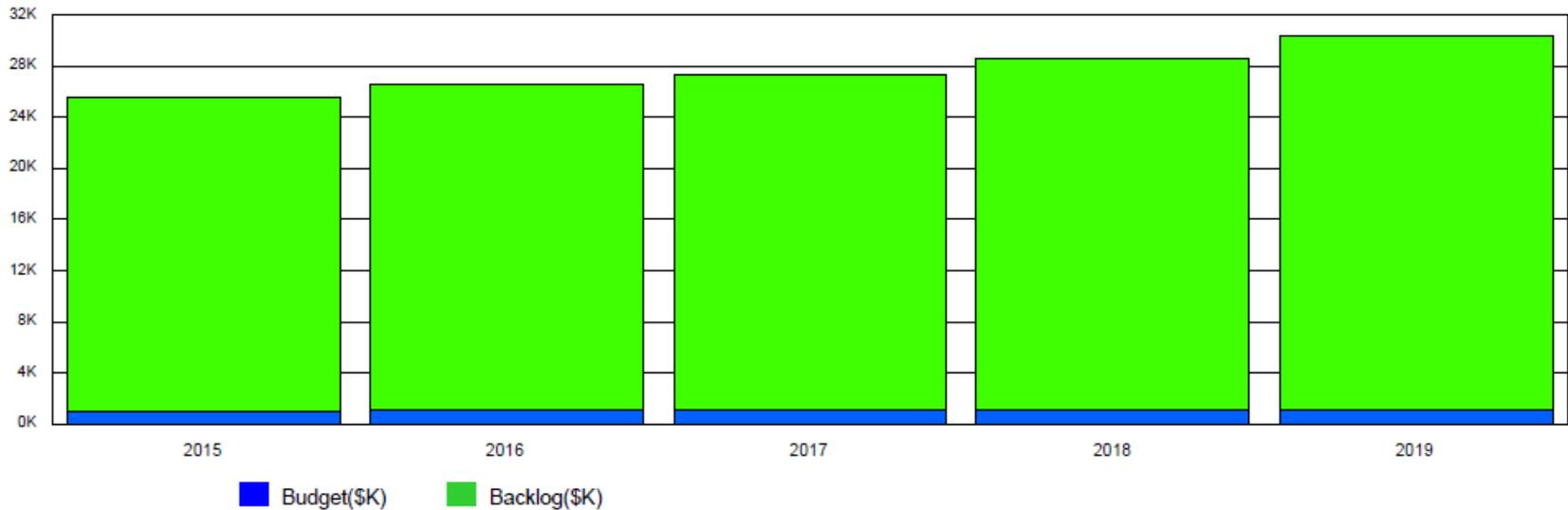
Priority Projects

	Street	From	To	Strategy	Estimated Cost(\$K)
2015	BAY CREST AVE	W SIDE OF LEISURE LN	E SIDE OF ROCKWOOD DR	Reconstruction - AC	281.93
	ROCKWOOD DR	N SIDE OF 13TH ST, HAR-BER RD	1623' N SIDE OF 13TH ST, HAR-BER RD	Reconstruction - AC	178.53
					460.46
2016	BAY CREST AVE	E SIDE OF ROCKWOOD DR	E SIDE OF LOOKOUT LN	Reconstruction - AC	194.81
	E 10TH ST	E SIDE OF CHEROKEE ST	W SIDE OF SHUNDI RD S 630 RD	Overlay AC - Structural	109.42
	E 7TH ST	W SIDE OF SHUNDI RD S 630 RD	E SIDE OF CHEROKEE ST	Overlay AC - Structural	109.96
					414.18
2017	LEISURE LN	US-59	N SIDE OF BAYCREST AVE	Overlay AC - Structural	77.49
	N 3RD ST	E SIDE OF SHUNDI RD	W SIDE OF FORD RD S 630 RD	Reconstruction - AC	291.24
					368.73
2018	LAKE RD 3	E SIDE OF S MAIN ST	E SIDE OF SUMAC RD	Reprocess and Overlay	161.52
	N QUAIL RUN RD	S SIDE OF E 300 RD	S SIDE OF BAY CREST AVE	Reprocess and Overlay	84.81
	S BROADWAY ST	N SIDE OF 13TH ST, HAR-BER RD	S SIDE OF W 4TH ST	Overlay AC - Structural	143.14
					389.47

Top ten priority locations from City staff

Current Funding Scenario

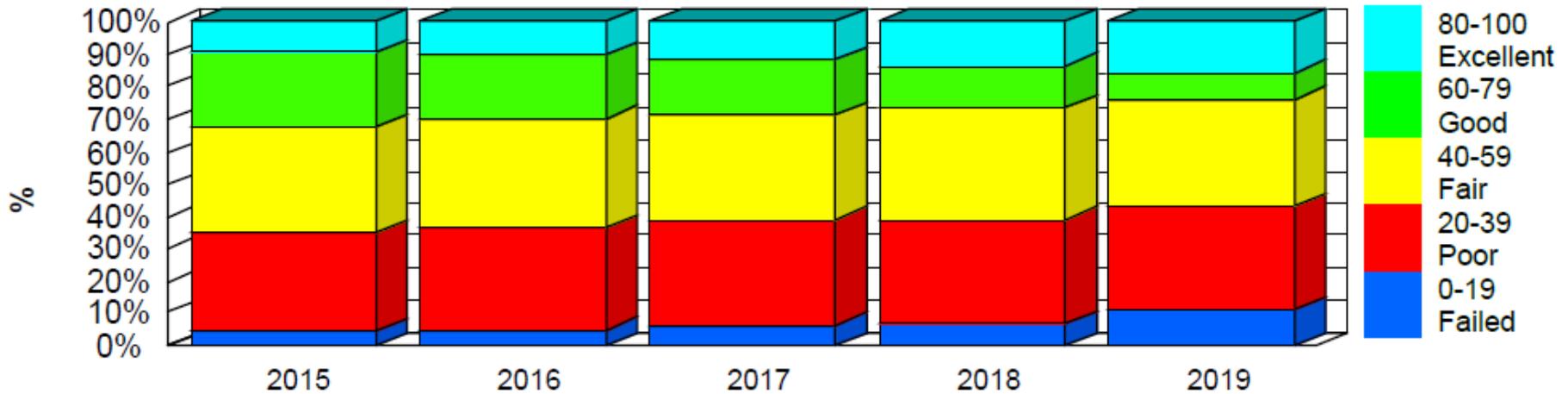
<u>Year</u>	<u>Budget (\$K)</u>	<u>Backlog (\$K)</u>	<u>Backlog: Budget</u>	<u>Average CI</u>
2015	956	24,542	25.66	51
2016	986	25,466	25.82	51
2017	987	26,365	26.71	50
2018	981	27,683	28.22	49
2019	962	29,447	30.62	49
	974	26,701	27.41	50.0
	4,872			



Backlog increases by 20% & PCI drops to 49

Current Funding Scenario

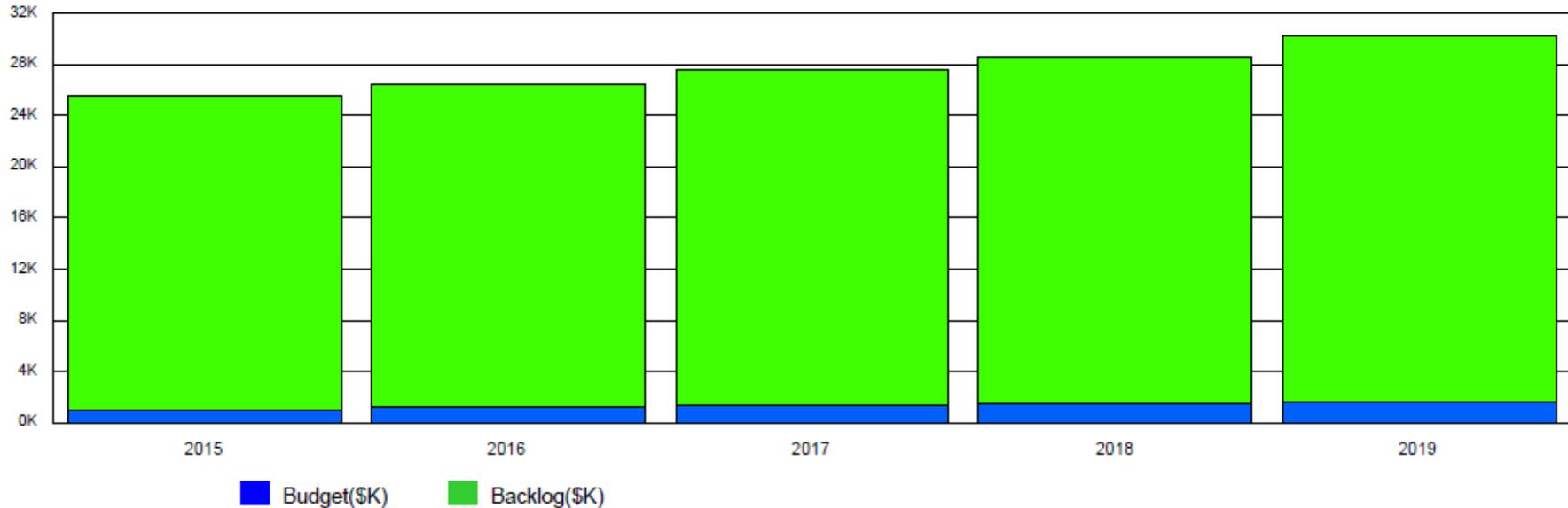
Predicted Pavement Area in Each Condition Range
Current Funding



60 to 100 decreasing
40 to 59 constant
0 to 39 increasing

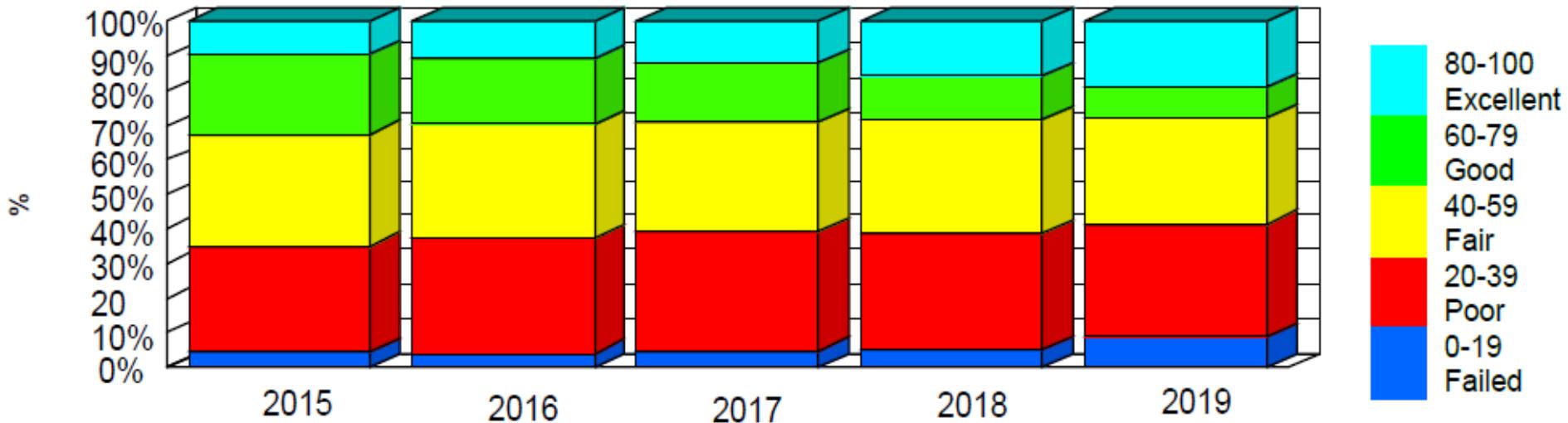
Level PCI Funding Scenario

<u>Year</u>	<u>Budget (\$K)</u>	<u>Backlog (\$K)</u>	<u>Backlog: Budget</u>	<u>Average CI</u>
2015	956	24,543	25.68	51
2016	1,122	25,277	22.53	51
2017	1,262	26,289	20.83	51
2018	1,430	27,221	19.03	51
2019	1,570	28,641	18.24	51
	1,268	26,394	21.26	50.9
	6,340			



Backlog increases by 17% & PCI stays at 51

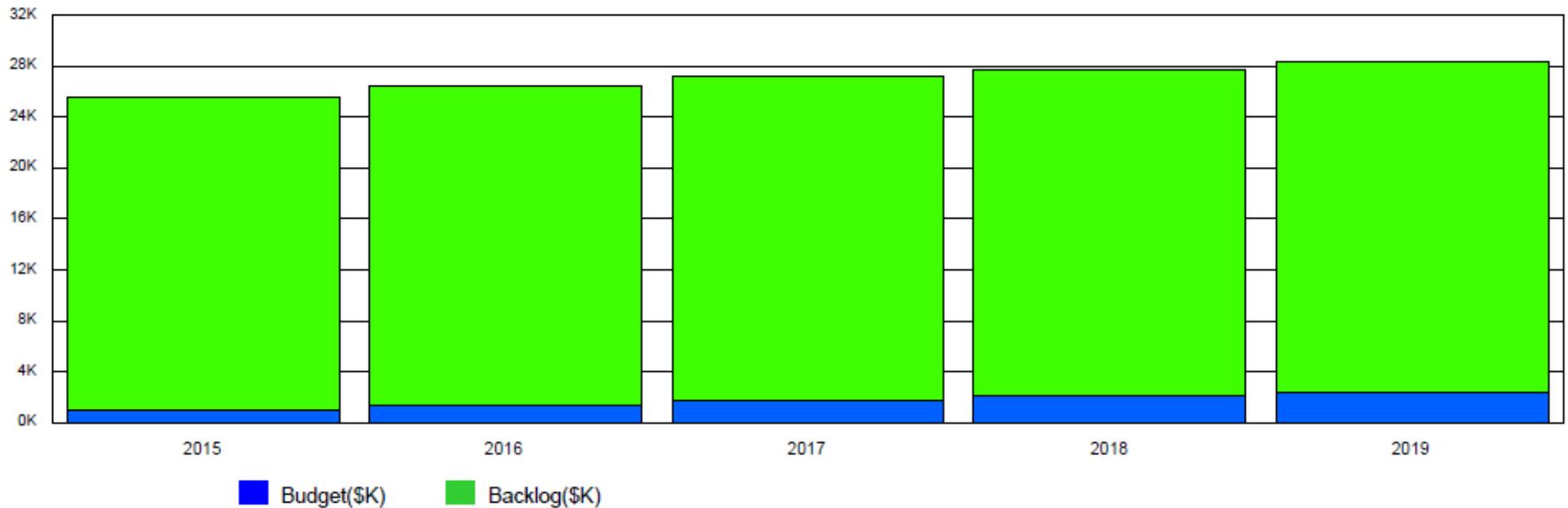
Level PCI Funding Scenario



60 to 100 decreasing
40 to 59 constant
0 to 39 increasing

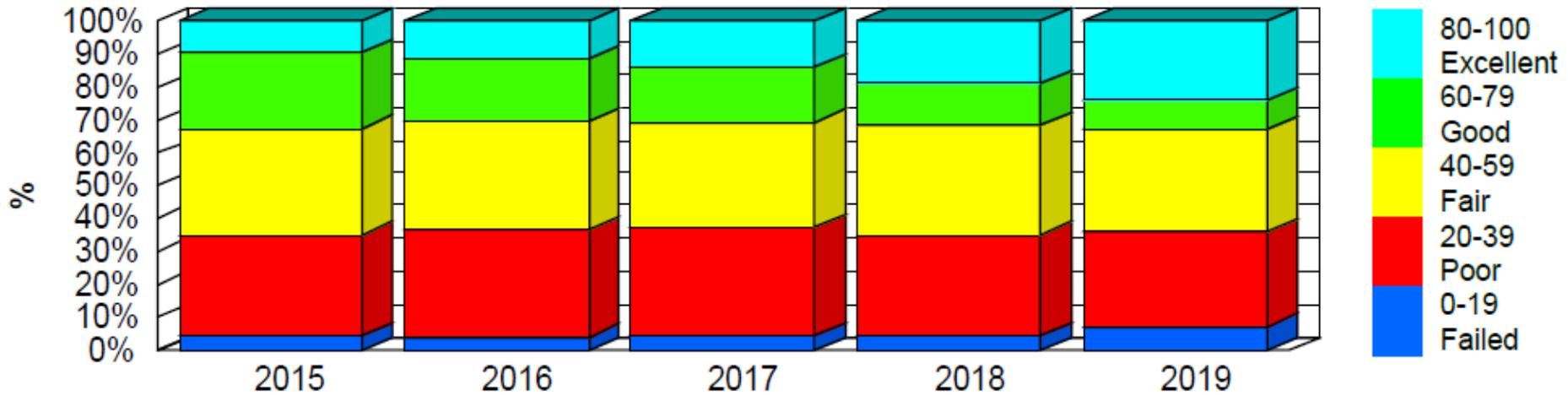
PCI=55 in 2019 Funding Scenario

<u>Year</u>	<u>Budget (\$K)</u>	<u>Backlog (\$K)</u>	<u>Backlog: Budget</u>	<u>Average CI</u>
2015	956	24,543	25.68	51
2016	1,329	25,071	18.87	51
2017	1,669	25,527	15.29	52
2018	2,036	25,665	12.61	53
2019	2,364	26,026	11.01	55
	1,671	25,366	16.69	52.6
	8,353			

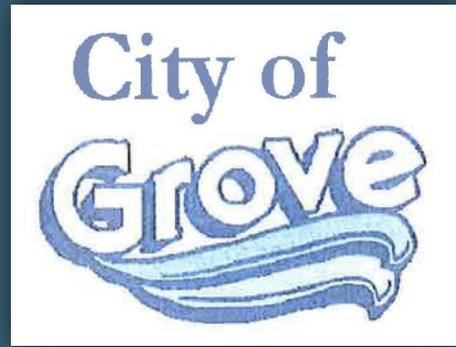


Backlog increases by 6% & PCI improves to 55

PCI=55 in 2019 Funding Scenario



60 to 100 constant
40 to 59 constant
0 to 39 constant



Questions?